

Welder-Fabricator Job Book

FINAL DRAFT; 09/13/2013
Apprenticeship Training Guidelines

Prepared by Bureau of Apprenticeship Standards State Industrial Mechanical & Fluid Maintenance Committee

WELDER-FABRICATOR JOB BOOK Section 1: Adhere to Welding and Fabricating Health and Safety Rules and Regulations

	Task	Date	JW Initials	Date	JW Initials	JAC
_	Adhere to AWS/ANSI Z49.1 2012	1	1	1	1	1
A.	The apprentice shall demonstrate awareness of the	followin	g, if applic	able:		
01	Section I: Purpose and Scope					
02	Section II: Definitions					
03	Section III: General Provisions, Management and					
	Supervision					
04	Section IV: Protection of Personnel & General					
	Area					
05	Section V: Ventilation					
06	Section VI: Fire Protection and Prevention					
07	Section VII: Confined Space					
08	Section IX: Precautionary Information					
09	Section X: Cutting Safety					
10	Section XI: Arc Welding Safety					
11	Section XII: Resistance Welding Safety					
12	Other Section(s) As Needed by Employer					
	Please specify:					
В.	Adhere to OSHA Standards					
D .	The apprentice shall properly perform the following,	if applic	able			
01	Lock-out and tag-out procedures					
02	Enter and exit confined spaces					
03	Locate and interpret MSDS information					
04	Protect self and other workers from possible					
	electrical hazards and electrocution					
05	Apply fall protection safety based on conditions					
06	Use ladders safely					
07	Handle and store gas cylinders					
80	Demonstrate awareness of guard safety					
09	Other (specify):					
10	Other (specify):					
11	Other (specify):					
C.	Adhere to employer safety practices and proced					
	The apprentice shall properly perform the following,	if applic	able	1	1	1
01	Follow permitting procedures including					
	depressurizing and cleaning pipes and systems					
02	Maintain clean and safe work areas					
03	Use tool, machine and shop equipment	1				
	safeguards, such as screening and guarding					
04	Manually lift and move metal, materials,	1				
0.5	assemblies, and finished goods safely	-				
05	Obtain proper certifications for material handling	1				
00	(ex. fork lift, crane, pallet jacks, etc.)	-				
06	Protect against fires and is prepared to use fire	1				
07	extinguishers	-				
07	Respond to emergencies based on employer	1				
	specific training	<u> </u>	<u> </u>		1	

08	Other (specify):			
09	Other (specify):			
10	Other (specify):			

WELDER-FABRICATOR JOB BOOK Section 2: Interpret Technical Drawings, Prints, Job Specifications and Orders

	Task	Date	JW Initials	Date	JW Initials	JAC
Α	Identify materials of construction	I.		l .		
Α.	Apprentices must demonstrate the ability to properly identify	and exp	lain the fo	llowing	, if applica	able:
01	Type of material and its properties, such as:					
	• Ferrous					
	Non-ferrous					
	Copper					
	• Brass					
	Stainless steel					
	Aluminums					
	Other					
02	Structural components and their required dimensions, such					
	as:					
	Angles					
	Channels					
	Sheet or plate					
	• I-beams					
	Other					
03	Fasteners and how to measure them, such as:					
	• Bolts					
	• Screws					
	Rivets					
	• Other					
04	Other (specify):					
05	Other (specify):					
06	Other (specify):					
	Interpret bill of materials	I				
B.	Apprentices must demonstrate the ability to perform the follow	ving, if	applicable) <i>:</i>		
01	Select proper materials for job per print	<i>J</i> ,	7-7			
02	Identify and explain description, quantity, and part number					
03	Verify material dimensions					
04	Identify heat/lot number of materials specified					
05	Adhere to employer's traceability process(es)					
06	Other (specify):					
07	Other (specify):					
08	Other (specify):					
	Identify title block contents	I				
C.	Apprentices must demonstrate the following, if applicable:					
01	Customer					
02	Name of part					
03	Part number					
04	Revision Level / Description					
05	Date of drawing					
06	Tolerance					
07	Drawn by, checked by (or both)					
08	First or third angle projections					
09	Drawing scale					

10	Other (specify):							
11	Other (specify):							
12	Other (specify):							
D.	Identify and interpret blueprints							
D.	Apprentices must correctly identify and interpret the following	g, if app	licable:					
01	Line types							
02	Orthographic views							
03	Isometric views							
04	Weld and Non-Destructive Examination (NDE) symbols							
	(AWS and ISO)							
05	Dimensioning							
06	Geometric dimensioning and tolerance (GD&T)							
07	Finishing technique and level							
80	Machining symbols							
09	Drawing section views and details							
10	Other (specify):							
11	Other (specify):							
12	Other (specify):							
E.	Identify and interpret job specifications per shop instruc							
	Apprentices must correctly identify and interpret the following	g, if app	licable:	1				
01	Hold point							
02	Required processes							
03	Run time							
04	Inspection processes							
05	Required tooling or fixtures							
06	Other (specify):							
07	Other (specify):							
80	Other (specify):							

WELDER-FABRICATOR JOB BOOK

Section 3: Perform Welds Using All Processes, Positions and Materials Available to Employer, According to Prescribed Techniques and Industry Standards

	Task	Date	JW Initials	Date	JW Initials	JAC
_	Shielded Metal Arc Welding (SMAW)	1		1		1
Α.	Apprentices must properly perform the following, if applicable	ə <i>:</i>				
01	Interpret and explain the appropriate weld procedure					
	specifications:					
	machine type					
	• polarity					
	• filler metal					
	base metals					
	ampsvolts					
	voitsposition					
	Other (please specify):					
02	Inspect welding equipment and complete equipment					
	validations					
03	Troubleshoot welding and shop equipment					
04	Perform routine and preventative maintenance on welding					
	machines and equipment					
05	Perform qualification test per applicable code or standard					
06	Obtain and maintain industry certifications based on					
07	employer need					
07	Other (specify):					
08 09	Other (specify):					
	Other (specify): Gas Metal Arc Welding or MIG Welding (GMAW)					
B.	Apprentices must properly perform the following, if applicable	. ·				
01	Interpret and explain the appropriate weld procedure					
	specifications:					
	machine type					
	• polarity					
	filler metal					
	base metals					
	• amps					
	• volts					
	• position					
00	Other (please specify): Inspect wolding aguipment and complete aguipment			-		
02	Inspect welding equipment and complete equipment validations					
03	Troubleshoot welding and shop equipment			 		
04	Perform routine and preventative maintenance on welding					
]	machines and equipment					
05	Perform qualification test per applicable code or standard					
06	Obtain and maintain industry certifications based on					
	employer need					
07	Other (specify):					
80	Other (specify):			<u> </u>		

Cas Tungsten Arc or TIG Welding Apprentices must properly perform the following, if applicable: Interpret and explain the appropriate weld procedure specifications: machine type polarity filler metal base metals position Other (please specify): Inspect welding equipment and completes equipment validations Troubleshoot welding and shop equipment Perform routine and preventative maintenance on welding machines and equipment Diate (specify): Di	09	Other (specify):					
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Apprentices must properly perform the following, if applicable: 1 Interpret and explain the appropriate weld procedure specifications: • machine type • polarity	11						
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• polarity		•			1		
					1		
• tiller metal					1		
		tiller metal		1			

	base metals			
	• amps			
	• volts			
	• position			
	Other (please specify):			
02	Inspect welding equipment and complete equipment			
-	validations			
03	Troubleshoot welding and shop equipment			
04	Perform routine and preventative maintenance on welding			
	machines and equipment			
05	Perform qualification test per applicable code or standard			
06	Obtain and maintain industry certifications based on			
	employer need			
07	Other (specify):			
80	Other (specify):			
09	Other (specify):			
F.	Resistance Welding (RW)			
г.	Apprentices must properly perform the following, if applicable	ə <i>:</i>		
01	Interpret and explain the appropriate weld procedure			
	specifications:			
	machine type			
	base metals			
	• amps			
	• volts			
	• position			
	Other (please specify):			
02	Inspect welding equipment and complete equipment			
	validations			
03	Troubleshoot welding and shop equipment			
04	Perform routine and preventative maintenance on welding			
	machines and equipment			
05	Perform qualification test per applicable code or standard			
06	Obtain and maintain industry certifications based on			
	employer need			
07	Other (specify):			
80	Other (specify):			
09	Other (specify):			

WELDER-FABRICATOR JOB BOOK Section 4: Produce Precision Fabricated Parts and Assemblies According to Specifications

		1	ı		-	
	Task	Date	JW Initials	Date	JW Initials	JAC
Α.	Verify job specifications and tolerances	1.	I.	I.	.1	
ί.	The apprentice shall properly perform the following,	if applic	able:			
01	Verify title block requirements					
02	Identify and interpret job specifications per shop					
	instructions					
03	Other (please specify):					
04	Other (please specify):					
05	Other (please specify):					
В.	Perform routine and preventative maintenance of and equipment	on asser	mbly and	fabricat	ion machi	nes
	The apprentice shall properly perform the following,	if applic	able:			
01	Read the owner's manual for the designated					
	equipment					
02	Successfully complete employer's training for the					
	designated equipment					
03	Troubleshoot and implement corrective action,					1
	according to employer policy					
04	Ensure safety features are present and active					
03	Other (please specify):					
04	Other (please specify):					
05	Other (please specify):					<u> </u>
C.	Prep base metals for production and subsequer					
0.4	The apprentice shall properly perform the following.	іт аррііс	able:	I		
01	Cleaning					
02	Cutting					
03	Grinding					
04	Sandblasting					
05	Priming Deliating					
06	Painting Other (appoint)				1	
07	Other (specify):					-
80	Other (specify):					
09	Other (specify): Perform fabrication processes according to con	nany o	efety nelic	l Noc		<u> </u>
D.	The apprentice shall properly perform the following.			,ies		
01	11 1 1	п аррпо	avie.			Π
02	Cutting Sawing					
02	Drilling				-	
03	Shearing				-	
05	Punching					
06	Grinding					
06	Forming					
08	Mechanically inserted fasteners				1	\vdash
09	Other (specify):				1	\vdash
10	Other (specify):				1	\vdash
11	Other (specify):				1	\vdash
1.1	Other (specify).		l	<u> </u>	1	L

	Measure metal and material stock					
E.	The apprentice shall properly perform the following,	if applic	able:			
01	Identify appropriate measuring tool and equipment	паррис	45.0.			
02	Ensure proper calibration of measuring tool and					
02	equipment per company standard					
03	Demonstrate correct use of measuring tool and					
	equipment					
04	Verify measurement according to job					
	specifications					
05	Other (specify):					
06	Other (specify):					
07	Other (specify):					
	Calculate and convert units of measurement in t	he cont	ext of pri	nts and	job	
F.	specifications:		•		-	
	The apprentice shall calculate and convert the follow	ving, if a	pplicable:	1		
01	Angles					
02	Volumes					
03	Area					
04	Fractions					
05	Density/weight					
06	Other (specify):					
07	Other (specify):					
80	Other (specify):					
G.	Lay out parts, shapes and locations					
G.	The apprentice shall properly perform the following,	if applic	able:			_
01	Parallel line development					
02	Radial line development					
03	Triangulation					
04	Square-to-round, cone, etc.					
05	Other (specify):					
06	Other (specify):					
07	Other (specify):					
н.	Assemble parts, pieces and components					
	The apprentice shall properly perform the following,	if applic	able:			
01	Verify all dimensions and tolerances					
02	Review prints, notes and job specifications					
03	Assemble accordingly					
04	Other (specify):					
05	Other (specify):					
06	Other (specify):					

A. Produce parts according to prints and specifications Apprentices must properly perform the following, if applicable: 11 Verify work quality and tolerance 22 Select proper automated and/or manual cutting process 33 Perform routine and preventative maintenance on equipment 44 Set up automated and/or manual cutting equipment 55 Apply safe cutting practices and procedures to jobs and work zones 66 Other (specify): 67 Other (specify): 68 Automated cutting (ex. laser, water jet, high-definition plasma, etc.) Apprentices must properly perform the following, if applicable: 75 Set up automatic cutting equipment 76 Demonstrate awareness of all equipment safety features and employer safety processes 77 Produce part according to prints and specifications 78 Perform routine and preventative maintenance 79 Demonstrate awareness of all equipment safety features and employer safety processes 80 Produce part according to prints and specifications 91 Verify work quality and tolerances 92 Produce part according to prints and specifications 93 Produce part according to prints and specifications 94 Verify mork quality and tolerances 95 Perform routine and preventative maintenance 96 Use other technologies based on employer needs (ex. nesting, programming) 97 Metal finishing, such as deburring, cleaning, tab removal and labeling 98 Other (please specify): 99 Other (please specify): 90 Other (please specify): 90 Other (please specify): 91 Other (please specify): 92 Produce part according to the material being used (ex. feed rates, speeds, blade, etc.) 94 Verify work quality and tolerances 95 Perform routine and preventative maintenance 96 Use other technologies based on employer needs 97 Produce part according to prints and specifications 98 Produce part according to employer needs 99 Produce part according to employer needs 90 Produce part according to employer needs 90 Profure routine and preventative maintenance 90 Use other technologies based on employer needs 90 Produce part according to t		WELDER-FABRICATOR JOB Section 5: Perform All Cutting Processes		to Empl	oyer		
Apprentices must properly perform the following, if applicable: 1 Verify work quality and tolerance 2 Select proper automated and/or manual cutting process 3 Perform routine and preventative maintenance on equipment 4 Set up automated and/or manual cutting equipment 5 Apply safe cutting practices and procedures to jobs and work zones 6 Other (specify): 7 Other (specify): 8 Automated cutting (ex. laser, water jet, high-definition plasma, etc.) Apprentices must properly perform the following, if applicable: 5 et up automatic cutting equipment 2 Demonstrate awareness of all equipment safety features and employer safety processes 3 Produce part according to prints and specifications 4 Verify work quality and tolerances 6 Use other technologies based on employer needs (ex. nesting, programming) 8 Other (please specify): 9 Demonstrate awareness of all equipment safety features and employer safety processes (ex. programming) O Metal finishing, such as deburring, cleaning, tab removal and labeling 10 Set up sawing equipment according to the material being used (ex. feed rates, speeds, blade, etc.) 11 Demonstrate awareness of all equipment safety features and employer safety processes and employer sa		Task	Date		Date		JAC
Apprentices must properly perform the following, if applicable: 10 Verify work quality and tolerance 22 Select proper automated and/or manual cutting process 33 Perform routine and preventative maintenance on equipment 44 Set up automated and/or manual cutting equipment 55 Apply safe cutting practices and procedures to jobs and work zones 66 Other (specify): 67 Other (specify): 68 Other (specify): 69 Automated cutting (ex. laser, water jet, high-definition plasma, etc.) 60 Apprentices must properly perform the following, if applicable: 58 tup automatic cutting equipment 60 Demonstrate awareness of all equipment safety features and employer safety processes 60 Produce part according to prints and specifications 60 Verify work quality and tolerances 61 Perform routine and preventative maintenance 62 Use other technologies based on employer needs (ex. ensting, programming) 63 Other (please specify): 64 Other (please specify): 65 Other (please specify): 66 Other (please specify): 67 Other (please specify): 68 Other (please specify): 69 Other (please specify): 60 Demonstrate awareness of all equipment safety features and employer safety processes 60 Perform routine and preventative maintenance 61 Use other technologies based on employer needs (ex. ender ates, speeds, blade, etc.) 60 Demonstrate awareness of all equipment safety features and employer safety processes 61 Other (please specify): 62 Demonstrate awareness of all equipment safety features and employer safety processes 63 Produce part according to prints and specifications 64 Verify work quality and tolerances 65 Perform routine and preventative maintenance 66 Use other technologies based on employer needs (ex. programming) 67 Metal finishing, such as deburring, cleaning, tab removal and labeling 68 Other (please specify): 69 Other (please specify): 70 Other (please specify): 71 Other (please specify): 72 Other (please specify): 73 Other (please specify): 74 Other (please specify): 75 Other (please specify): 76 Ot	Α.						
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D. Apprentices must properly perform the following, if applicable: O1 Set up automatic cutting equipment O2 Demonstrate awareness of all equipment safety features and employer safety processes O3 Produce part according to prints and specifications O4 Verify work quality and tolerances O5 Perform routine and preventative maintenance Use other technologies based on employer needs (ex. nesting, programming) O7 Metal finishing, such as deburring, cleaning, tab removal and labeling O8 Other (please specify): O9 Other (please specify): O1 Other (please specify): O2 Sawing Apprentices must properly perform the following, if applicable: O1 Set up sawing equipment according to the material being used (ex. feed rates, speeds, blade, etc.) O2 Demonstrate awareness of all equipment safety features and employer safety processes O3 Produce part according to prints and specifications O4 Verify work quality and tolerances O5 Perform routine and preventative maintenance O6 Use other technologies based on employer needs (ex. programming) O7 Metal finishing, such as deburring, cleaning, tab removal and labeling O8 Other (please specify): O9 Other (please specify): O1 Other (please specify): O2 Demonstrate awareness of all equipment safety features and are programming to the material being used O2 Demonstrate awareness of all equipment safety features and employer safety processes	80						
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used 02 Demonstrate awareness of all equipment safety features and employer safety processes	01						
02 Demonstrate awareness of all equipment safety features and employer safety processes							
	02	Demonstrate awareness of all equipment safety features					
	03	Produce part according to prints and specifications			 		

04	Verify work quality and tolerances				
05	Perform routine and preventative maintenance				
06	Use other technologies based on employer needs				
00	(ex. programming)				
07	Metal finishing, such as deburring, cleaning, tab removal				
07	and labeling				
08	Other (please specify):				
09	Other (please specify):				
10	Other (please specify):				
	Plasma (Manual Cutting and Gouging)				
E.	Apprentices must properly perform the following, if applicable				
01	Set up equipment according to the material being used	<i>).</i> 		1	
02	Demonstrate awareness of all equipment safety features				
02	and employer safety processes				
03	Produce part according to prints and specifications				
04	Verify work quality and tolerances				
05	Perform routine and preventative maintenance				
06	Use other technologies based on employer needs				
07	Metal finishing, such as deburring, cleaning, tab removal	 			
07	and labeling				
08	Other (please specify):				
09	Other (please specify):				
10	Other (please specify):				
	Oxy fuel (Manual Cutting and Gouging)		l l		
F.	Apprentices must properly perform the following, if applicable	a,			
01	Set up equipment according to the material and fuel/gas). 			
• •	being used				
02	Demonstrate awareness of all equipment and gas cylinder				
	safety features and employer safety processes				
03	Produce part according to prints and specifications				
04	Verify work quality and tolerances				
05	Perform routine and preventative maintenance				
06	Use other technologies based on employer needs				
07	Metal finishing, such as deburring, cleaning, tab removal				
	and labeling				
08	Other (please specify):				
09	Other (please specify):				
10	Other (please specify):				
	Gouging (Air Carbon Arc)			l	
G.	Apprentices must properly perform the following, if applicable	ə:			
01	Set up equipment according to the material being used				
02	Demonstrate awareness of all equipment safety features				
	and employer safety processes				
03	Produce part according to prints and specifications				
04	Verify work quality and tolerances				
05	Perform routine and preventative maintenance				
06	Use other technologies based on employer needs				
07	Metal finishing, such as deburring, cleaning, tab removal				
	and labeling				
08	Other (please specify):				
09	Other (please specify):				
10	Other (please specify):				
	N 1 1/			I	

	WELDER-FABRICATOR JOB Section 6: Perform Inspection of Welds, Pa		Assemb	lies		
	Task	Date	JW Initials	Date	JW Initials	JAC
A.	Perform inspection of welds					
	Apprentices must properly perform the following, if applicable	e:	ı	1	I	1
01	Identify applicable print, code, standard or company policy					
02	Self-inspect weld					
03	Verify the results meet print, code, standard or company policy					
04	Use appropriate inspection tools					
	(ex. fillet gauge, dye penetrant, mag particle, etc.)					
05	Document conformance/non-conformance of results					
06	Take appropriate corrective action, if necessary					
07	Other (specify):					
08	Other (specify):					
09	Other (specify):					
В.	Perform inspection of components and parts	•	•	•	•	
Б.	Apprentices must properly perform the following, if applicable	e:				
01	Identify applicable code, standard, print or company policy					
02	Self-inspect component or part					
03	Measure and document appropriate dimensions					
04	Verify component or part is within appropriate tolerances					
	per print, code, standard or company policy					
05	Verify part numbers, revisions, and quantities					
06	Use appropriate inspection tools					
	(ex. caliper, tape measure, protractor, etc.)					
07	Document conformance/non-conformance of results					
80	Take corrective action, if necessary					
09	Other (specify):					
10	Other (specify):					
11	Other (specify):					
C.	Perform inspection of assemblies					
	Apprentices must properly perform the following, if applicable	<u>e:</u>	T	ı	T	П
01	Verify assembly fits together correctly					
02	Verify assembly operates correctly					
03	Verify assembly is within appropriate dimensions and					
0.1	tolerances per print, code, standard or company policy					
04	Use appropriate inspection tools	1				
05	Document conformance/non-conformance of results					
06	Take corrective action, if necessary					
07	Other (specify):	1				
80	Other (specify):					
09	Other (specify):					

	Section 7: Perform Basic Forming Processes DELET	T	JW		JW	140		
	Task	Date	Initials	Date	Initials	JAC		
Α.	Practice safe forming work procedures							
Λ.	Apprentices must properly perform the following, if applicable	e:						
01	Demonstrate awareness of equipment operators manual							
	and company practices							
02	Explain how light curtains function, and identify whether							
	they are working properly							
03	Explain how foot pedals function, and identify whether they							
	are working properly							
04	Explain how the emergency stop button functions, and							
	identify whether it is working properly							
05	Explain how the RAM functions, and identify whether it is							
	working properly							
06	Demonstrate knowledge of controller safety features							
07	Other (specify):							
80	Other (specify):							
09	Other (specify):							
В.	Calculate bend allowances							
ъ.	Apprentices must properly perform the following, if applicable	e:						
01	Explain and calculate K-factor							
02	Verify correct blank size							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
	Set up automated forming equipment (hydraulic, pneumatic, and electric) based on job							
C.	requirements							
	Apprentices must properly perform the following, if applicable:							
01	Demonstrate awareness of equipment operators manual							
	and company practices							
02	Explain difference between coining and air-bending							
03	Explain the limitations of the tooling and equipment							
	Ex. (max tonnage of tooling, material thickness, etc.)							
04	Demonstrate proper installation of tooling							
05	Verify proper depth settings							
06	Adjust material support arm according to part							
07	Verify RAM and back gauges are calibrated accurately							
80	Other (specify):							
09	Other (specify):							
10	Other (specify):							
D.	Bend metals	•	•		-	•		
υ.	Apprentices must properly perform the following, if applicable	e:						
01	Determine proper bend sequence							
02	Create the bend sequence program							
03	Select and install proper tooling							
04	Bend part per blueprint or work order							
05	Verify part is dimensionally correct per blueprint or work							
-	order							
06	Demonstrate control of crowning and taper							
	U 1							

08	Other (specify):							
09	Other (specify):							
	Use hand tools and manual forming equipment							
E.	Apprentices must properly perform the following, if applicable:							
01	Use hand tools safely	,. 						
02	Demonstrate awareness of equipment operators manual							
02	and company practices							
03	Explain the limitations of the tooling and equipment							
03	Ex. (max tonnage of tooling, material thickness, etc.)							
04	Adjust manual forming equipment to accommodate various							
04	thicknesses							
05	Bend part per blueprint or work order							
06	Verify part is dimensionally correct per blueprint or work							
	order							
07	Other (specify):							
80	Other (specify):							
09	Other (specify):							
F.	Roll various types of metals							
• •	Apprentices must properly perform the following, if applicable) :						
01	Demonstrate awareness of equipment operators manual							
	and company practices							
02	Explain how the emergency stop button functions, and							
	identify whether it is working properly							
03	Verify correct blank size							
04	Verify correct material thickness							
05	Adjust machine for appropriate material thickness							
06	Adjust machine for appropriate radius							
07	Roll part per blueprint or work order							
08	Verify part is dimensionally correct per blueprint or work							
	order							
09	Other (specify):							
10	Other (specify):							
11	Other (specify):							
	Perform other forming processes based on employer sp	ecific s	ituations					
H.	(ex. pipe or tube bending)							
	Apprentices must properly perform the following, if applicable	ə <i>:</i>						
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
	• • • • • • • • • • • • • • • • • • • •	*	•	•				

	WELDER-FABRICATOR JOB BOOK Section 8: Perform Job Set-up Operations in Order to Control Distortion						
	Task	Date	JW Initials	Date	JW Initials	JAC	
A.	Apply metallurgical principles based on job specification						
Λ.	Apprentices must properly perform the following, if applicable	э:					
01	Verify job tolerances per production documents						
02	Explain the metal identification systems (AISI, ASTM, SAE, UNS)						
03	Explain characteristics of materials used (ex. hardness, tensile strength, ductility, direction of roll, grain structures, etc.)						
04	Explain cross-contamination						
05	Other (specify):						
06	Other (specify):						
07	Other (specify):						
В	Apply heat distortion control techniques	•					
B.	Apprentices must properly perform the following, if applicable	ə <i>:</i>					
01	Explain the thermal properties of the material used						
02	Explain the welding sequence						
03	Use welding and fabrication jigs and fixtures						
04	Perform pre-heat and post-weld heating when applicable						
05	Explain and/or perform heat straightening techniques						
06	Other (specify):						
07	Other (specify):						
08	Other (specify):						
C.	Monitor heat input						
C.	Apprentices must properly explain the following, and perform	if appli	cable:				
01	Methods of monitoring heat input, such as temp sticks,						
	optical thermal monitors, calculations, etc.						
	Please specify:						
	Please specify:						
	Please specify:						
02	Methods of monitoring inter-pass weld temperatures:						
	Please specify:						
	Please specify:						
	Please specify:						
03	Post-weld heat treatments, such as thermal blankets and						
	electronically controlled equipment:						
	Please specify:						
	Please specify:						
	Please specify:						
04	Other (specify):						
05	Other (specify):						
06	Other (specify):						

	WELDER-FABRICATOR JOB BOOK Section 9: Apply Manufacturing Principles to Welding and Fabrication Work Processes						
	Task	Date	JW Initials	Date	JW Initials	JAC	
Α.	Manufacturing Efficiency						
	Apprentices must properly perform the following, if applicable	e	1		,		
01	Explain manufacturing efficiency concepts utilized by employer (ex. lean manufacturing, value stream mapping, 5S or 6S, just-in-time, etc.)						
	Please specify:						
	Please specify:						
	Please specify:						
02	Other (specify):						
03	Other (specify):						
04	Other (specify):						
B.	Quality Assurance						
	Apprentices must properly perform the following, if applicable	e	T	1	1		
01	Explain concepts of quality assurance utilized by employer (ex. ISO, Six Sigma, etc.)						
	Please specify:						
	Please specify:						
	Please specify:						
02	Explain and demonstrate employer's procedure for controlling non-conforming products						
03	Other (specify):						
04	Other (specify):						
05	Other (specify):						
C.	Continuous Improvement						
<u> </u>	Apprentices must properly perform the following, if applicable	e:					
01	Explain concepts of continuous improvement of manufacturing processes utilized by employer (ex. ISO, Six Sigma, etc.)						
	Please specify:						
	Please specify:						
	Please specify:						
02	Explain the employer's programs for individual development						
03	Suggest improvements to existing processes						
04	Other (specify):						
05	Other (specify):						
06	Other (specify):						
D.	"Green" Initiatives						
	Apprentices must explain and demonstrate the following, if a	pplicabl	e:	T	1		
01	Energy use awareness initiatives utilized by employer (ex. turning off equipment not in use)						
	Please specify:						

	Please specify:					
	Please specify:	<u> </u>		l	'	1
02	Waste disposal methods utilized by employer					
	(ex. recycling, weld fume particulate, hazardous materials)					1
	Please specify:					1
	Please specify:					1
	Please specify:				<u> </u>	
03	Environmental regulations adhered to by the employer					1
	(ex. WI DNR, EPA, OSHA)				<u> </u>	<u></u>
04	Other (specify):				'	
05	Other (specify):				'	<u> </u>
06	Other (specify):					
Е.	Other (please specify)					
L .	Apprentices must explain and demonstrate the following, if ap	<u>oplicabl</u>	e:			
01	Other (specify):				<u> </u>	
02	Other (specify):			<u> </u>		
03	Other (specify):				<u> </u>	<u> </u>

	WELDER-FABRICATOF Section 10: Local							
	Task	Date	JW Initia Is	Date	JW Initial s	JA C		
Α.	Other welding processes		•		•			
Α.	Apprentices must properly perform the following, if a	oplicable:						
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
В.	Other fabrication processes							
В.	Apprentices must properly perform the following, if a	oplicable:				•		
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
C.	Soldering and brazing							
C.	Apprentices must properly perform the following, if a	oplicable:						
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
D.	CNC equipment/software							
D.	Apprentices must properly perform the following, if a	oplicable:				•		
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
E.	Other (specify):							
⊏.	Apprentices must properly perform the following, if a	oplicable:				•		
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
F.	Other (specify):							
г.	Apprentices must properly perform the following, if a	oplicable:				•		
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							
05	Other (specify):							
G.	Other (specify):							
G.	Apprentices must properly perform the following, if a	oplicable:						
01	Other (specify):							
02	Other (specify):							
03	Other (specify):							
04	Other (specify):							

05	Other (specify):			